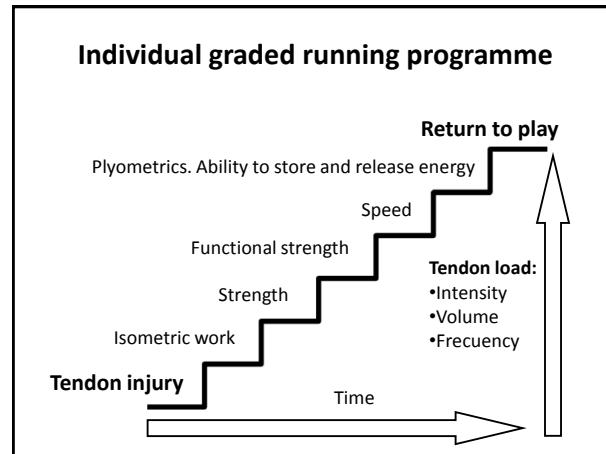


## Load management in tendinopathy: Clinical progression for Achilles and patellar tendinopathy

Alfons Mascaró, Miquel Àngel Cos, Antoni Morral, Andreu Roig, Craig Purdam, Jill Cook

# PATELLAR TENDINOPATHY



## 1-Isometric work:



1. Isometric of leg extension



2. Isometric bilateral work at 45°.



3. Catalan squat isometric bilateral at 45°



4. Isometric bilateral work at 90°.



5. Isometric unilateral work at 45°.



6. Catalan squat isometric bilateral at 90°



7. Isometric unilateral work at 90°



8. Isometric bilateral work at 90° with active stress. Lunge (affected leg behind).

## 2-Strength:



9. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Bilateral leg extension.

10. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Unilateral leg extension.



11. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Fitball with one leg.



12. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Catalan squat with both legs.

### **3-Functional strength:**



**13.** Functional strength. Slow dynamic, concentric, 4". Pulling the partner



**14.** Functional strength. Slow dynamic, stretch-shortening cycle. Climb the step.



**15.** Functional strength. Slow dynamic, eccentric, 4". Stopping the partner's traction



**16.** Functional strength. Lunge. Progressing speed, 2" concentric and 2" eccentric.



**17.** Functional strength. Lunge with step forward (affected leg behind), 4" eccentric and 4" concentric.



**18.** Functional strength. Lunge with step forward (affected leg behind), 2" eccentric and 2" concentric.



**19.** Functional strength. Load progression. Lunge with step forward (affected leg behind), 2" eccentric and 2" concentric.



**20.** Functional strength. Lunge stepping back (affected leg behind), 2" eccentric and 2" concentric.



**21.** Functional strength. Active stress on both legs, 2" eccentric and 2" concentric.



**22.** Functional strength. Progression to suspended active stress with TRX (affected leg behind), 2" eccentric and 2" concentric.

**4-Speed:**



**23.** Functional strength. Speed. Stretch-shortening cycle, 1" eccentric and 1" concentric. Skateboard on both legs.

**24.** Functional strength. Speed. Stretch-shortening cycle, 1" eccentric and 1" concentric. Lunge (affected leg behind).



**25.** Functional strength. Speed. Stretch-shortening cycle, 1" eccentric and 1" concentric. Catalan squat with both legs.



**26.** Functional strength. Speed. Stretch-shortening cycle, 1" eccentric and 1" concentric. Unilateral skateboard



**27.** Functional strength. Speed progression. Stretch-shortening cycle. Increase the angle of flexion of knee and ankle. Changing direction during execution. Reaching a lower point each time.

## **5-Plyometric/Jumping exercises to adapt the tendon to the ability to store and release energy:**

**28.** Jump landing. Preparation to plyometrics. Forward, with two legs, from floor to step.



**29.** Jump landing. Height progression. Forward, two legs, from step to floor.

**30.** Jump landing. Backward, with two legs, from step to floor.



**31.** Starting plyometrics. Progressing stretch-shortening cycle. Jumps with counter movement and landing on both legs.





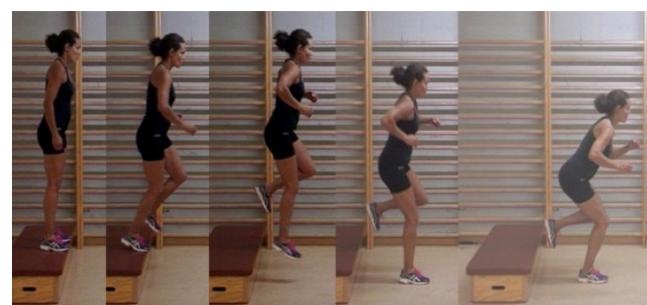
32. Starting plyometrics. Progressing stretch-shortening cycle. Jumps with counter movement and landing on both legs. From floor to step and from step to floor. Forward-backward.



33. Jump with counter movement and plyometrics on both legs, forward.



34. Progression of plyometrics with height. A-B-C sequence: Step-push one leg with counter movement-two-leg plyo from floor to box-plyo on the box-landing on the box. Sequence C-D two-leg jump with counter movement from box to floor-plyo on the floor-landing on the floor.



35. Starting plyometrics on one leg. Jump landing. Forward, from step to floor.



36. Starting plyometrics on one leg. Jump landing. Backward, from step to floor.



37. Progression. Plyometrics from height on both legs. Jump with counter movement from box to floor - plyometrics on floor over the hurdle - landing on floor.



38. One-leg plyometrics. Dynamic lunge alternating legs.



39. Progression. Plyometrics from height on both legs. Step - pushing one leg with counter movement - two-leg plyometrics over several hurdles, increasing hurdle height.



40. Progressing one-leg plyometrics. Speed progression. Backward run.



41. Progressing one-leg plyometrics. Height progression. "Penta": Step - pushing one leg with counter movement - one-leg plyometrics, alternating legs.



42. Progressing one-leg plyometrics. Step - pushing one leg with counter movement - one-leg plyometrics over several hurdles, same leg.



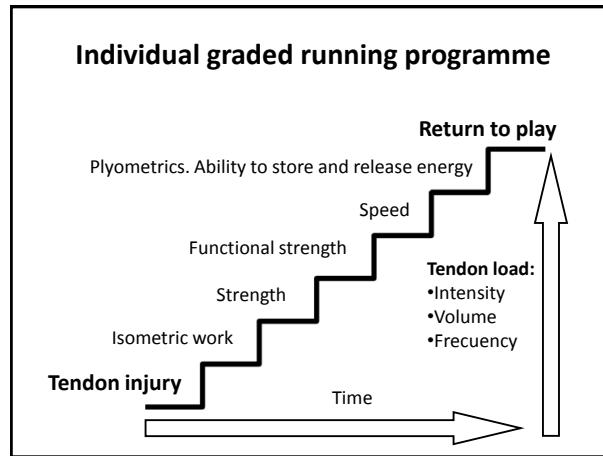
**43.** Progression to one-leg plyometrics. "Penta": Step - pushing one leg with counter movement - one-leg plyometrics, same leg.

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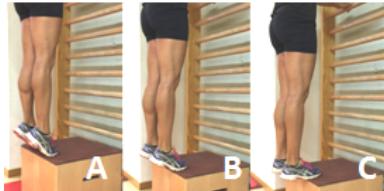
## Load management in tendinopathy: Clinical progression for Achilles and patellar tendinopathy

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# ACHILLES TENDINOPATHY



## 1-Isometric work:



1. Standing leg extension. Isometric on both legs (partial load). ROM progression to inner (A), middle (B) and outer (C).



2. Two examples seated knee flexion. Isometric on both legs (partial load). ROM progression to inner (A), middle (B) and outer (C).



3. Standing knee flexion. Isometric on both legs (partial load). ROM progression to inner (A), middle (B) and outer (C).



4. Isometric on one leg (full load). ROM progression to inner (A), middle (B) and outer (C).



5. Seated knee flexion. Isometric on one leg. ROM progression to inner (A), middle (B) and outer (C).



6. Standing knee flexion. Isometric on one leg (full load). ROM progression to inner (A), middle (B) and outer (C).

## **2-Strength:**



7. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" hold eccentric. Complete ankle ROM on both legs (partial load).



8. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Complete ankle ROM on both legs (partial load).



9. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Complete ankle ROM, concentric part on both legs and eccentric part on one leg.



10. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Complete ankle ROM on both legs (partial load), adding knee flexion to increase soleus recruitment.



11. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Complete ankle ROM on one leg (full load).



12. Strength. Slow dynamic, stretch-shortening cycle, 4" concentric and 4" eccentric. Complete ankle ROM (full load), adding knee flexion to increase soleus recruitment.

### **3-Functional strength:**



**13.** Functional strength. Slow dynamic, stretch-shortening cycle. Up and down the step.



**14.** Functional strength. Slow dynamic, concentric and eccentric. Concentric: pushing the partner (white pushes black). This is an exercise for some sports where a high dorsal foot flexion is needed e.g. Badminton

Functional strength. Slow dynamic, concentric and eccentric increasing the load (sand). Eccentric: stopping the partner's push (black is stopping white).



**15.** Functional strength. Slow dynamic concentric. Pushing the partner in ascent (black is pushing white).



**16.** Functional strength. Slow dynamic eccentric. Stopping the partner's push in descent (black is stopping white).



**17.** Functional strength. Slow dynamic concentric-eccentric.

### 4-Speed:

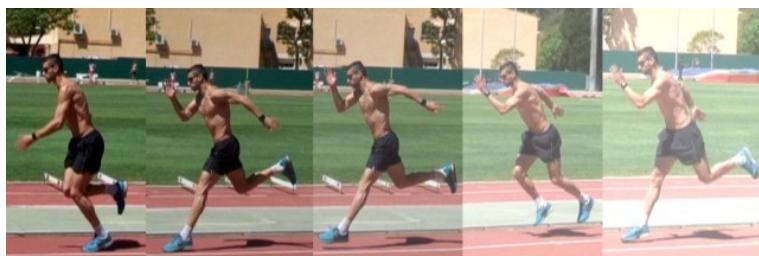


**18.** Speed. Stretch-shortening cycle. Run bringing the heels to the buttocks.



**19.** Speed. Stretch-shortening cycle. Run bringing the knees high: skipping.

Speed. Stretch-shortening cycle. Increasing the load. Forward-backward run - running on sand, changing directions.



**20.** Speed progression. Backward run.

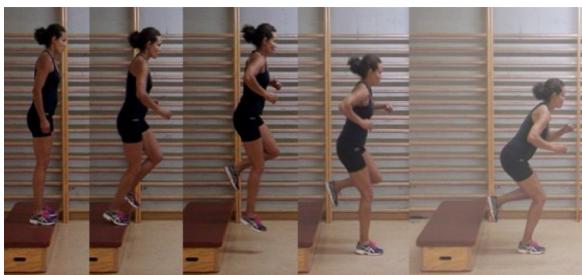
## **5-Plyometric/Jumping exercises to adapt the tendon to the ability to store and release energy:**



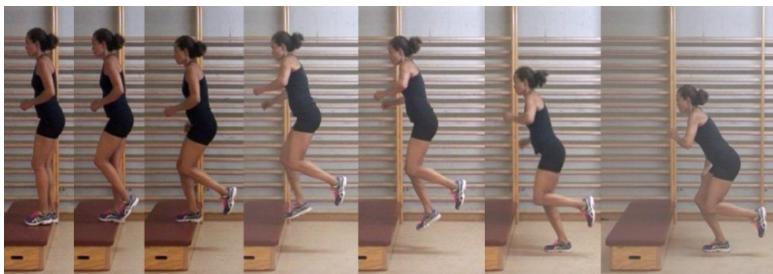
**21.** Starting plyometrics. Progressing stretch-shortening cycle. Jumps with counter movement and landing on both legs. From floor to step with landing and stop, and from step to floor with landing and stop, forward and backward.



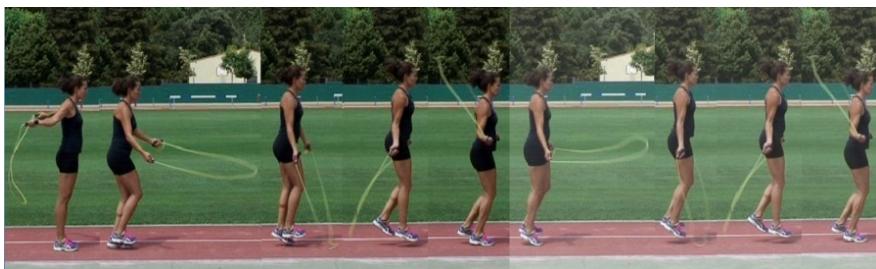
**22.** Plyometrics. Skipping the rope with both legs, low jumps.



**23.** Starting plyometrics on one leg. Landing forward jump from step to floor.



**24.** Starting plyometrics on one leg. Landing backward jump from step to floor.



**25.** Plyometrics. Skipping the rope with one leg, low jumps.



**26.** Plyometrics. Backward run, straight legs.



**27.** Plyometrics. Forward run, straight legs.



**28.** Plyometrics. Skip the rope with both legs jumping as high as possible, skipping twice on each jump.



**29.** Plyometrics. Jump forward with both legs skipping hurdles, alternating one high jump and one low jump between each hurdle.



**30.** Plyometrics. Jump forward with both legs alternating one high jump, one low jump, one high, one low... Adding some load (grass instead of track).



**31.** Plyometrics. Forward jump on both legs reaching as high as possible.



**32.** Plyometrics. Jumping forward with both legs reaching as high as possible, over the hurdles.



**33.** Plyometrics. Forward jump on both legs reaching as high as possible. Adding some load (grass instead of track).



**34.** Progression of plyometrics with height. A-B-C sequence: Step - push one leg with counter movement - two-leg plyo from floor to box - plyo on the box - landing on the box. C-D sequence: two-leg jump with counter movement from box to floor - plyo on the floor - landing on the floor.



**35.** Progression. Plyometrics from height on both legs. Jump with counter movement from box to floor - plyometrics on floor over the hurdle - landing on floor.



**36.** Progression. Plyometrics from height on both legs. Step - pushing one leg with counter movement - two-leg plyometrics over several hurdles, increasing hurdle height.



**37.** Progressing one-leg plyometrics. Height progression. "Penta": Step - pushing one leg with counter movement - one-leg plyometrics, alternating legs.



**38.** Progressing one-leg plyometrics. Step - pushing one leg with counter movement - one-leg plyometrics over several hurdles, same leg.



**39.** Progression to one-leg plyometrics. "Penta": Step - pushing one leg with counter movement - one-leg plyometrics, same leg.